

Innovation as a Political Process of Development: Are Neo-Schumpeterians Value Neutral?

Theo Papaioannou and Smita Srinivas

Development Policy and Practice, The Open University, Chambers Building

Walton Hall, Milton Keynes, MK7 6AA, UK

*School of Economic Development (SED), Indian Institute for Human Settlements (IIHS),
Bangalore 560 080, India*

Email: theo.papaioannou@open.ac.uk or ssrinivas3079@gmail.com

Abstract: Since the reconstruction of Joseph Schumpeter's view of innovation as a driver of capitalist development and the subsequent formation of the national innovation systems (NIS) theory in the early 1990s that can be described as neo-Schumpeterian, there has been a continuous attempt to analyse innovation. However, much of this has positioned innovation as a value-neutral process. We argue that such value-neutrality requires closer analysis because the neo-Schumpeterian thinkers do appear to acknowledge that capitalism itself is an uneven, dynamic process. The relationship between the vital dynamism of such analysis of technological change and the context of its description of power relations and value deserves further attention. Under what conditions are systemic interactions between institutions and actors potentially universalisable? Can the theory of innovation be abstracted from its social and political bases? This paper aims to redefine innovation as a predominately political process that is both historical and contextual, and thus draw out its implications for development politics.

Keywords: Values, innovation, Joseph Schumpeter, evolutionary economics, political economy of development

1. Introduction

Since the reconstruction of Joseph Schumpeter's view of innovation as a driver of capitalist development and the subsequent formation of the national innovation systems (NIS) theory in the early 1990s (Lundvall, 1992; Nelson, 1990, 1992, 1993; Freeman, 1995; Freeman and Soete, 1997; Edquist and Johnson, 1997; Edquist, 1997) – that can be aptly described as neo-Schumpeterian – there has been a continuous attempt to analyse innovation in diverse socio-economic contexts. However, much of this has positioned as a value-neutral process.

In this paper we argue that such value-neutrality requires closer analysis because the neo-Schumpeterian thinkers do appear to acknowledge that capitalism itself is an uneven, dynamic process of historical development. The relationship between the vital dynamism of such analysis of technological change and the context of its description of power relations and values deserves further attention. Under what conditions are systemic interactions between institutions and actors rendered potentially universalisable? Can the theory of innovation be abstracted from its social and political bases?

Clearly, as Commons (1924) and later Penrose (1952) have pointed out, institutional evolution involves 'artificial' selection. This implies that human (individual and collective) action is

international, guided not only by economic values and interests but also by moral and political values and interests. There is no such thing as pure calculative behaviour. Thus, it is clear that neither markets nor innovation systems evolve spontaneously as value-free or neutral mechanisms. Rather they are embedded in value-bound social, political and cultural relations. This means that their evolution is driven by both value and power conflicts which move societies and institutions towards particular normative directions, including liberalism and neo-liberalism.

The remainder of this paper is structured as follows. Section 2 analyses value-neutral versus value-bound innovation. Section 3 critically understands innovation as a social process that is driven by values and politics. Section 4 redefines innovation in terms of history and context. Section 5 concludes the paper by summarising the argument of innovation as a social and political process.

2. Value-Neutral versus Value-Bound Innovation

Some innovation scholars, apparently influenced by liberal and neo-liberal thinkers, including Hayek (1960) and Friedman (1962), have argued for a market fundamentalism in science and technology. Their arguments have been explicitly founded upon values of negative freedom (i.e. freedom from) and equality before the law (Berlin, 1969; Papaioannou, 2012). For them, public funding for scientific research and innovation projects ought to be withdrawn because the liberal state as such ought to remain neutral towards particular conceptions of the technological good, therefore also the economic and social goods. By contrast, consistent neo-Schumpeterian thinkers, including Freeman (1982, 1987, 1988, 1995) and Perez (2002), have argued for state intervention implicitly founded upon values of positive freedom (i.e. freedom

to) and substantive equality. In their view, cessation of public support to scientific research and innovation would have disastrous long-term consequences for both economic growth and social welfare in most countries because it is highly unlikely that free markets would compensate for the collapse of the state funding (see also Mazzucato 2014, Perez 2002 and Block and Keller 2011). However, they are still quite distant from overt attention to inequality and access to essential goods and services, offering quite traditional roles for states and markets in some dimensions, while challenging the conventional neo-Schumpeterian paradigm in other ways.

In sharp contrast, with inequality and development at their core, a different set of debates has emerged in response to value-neutral, hierarchical and exclusive innovation that has been directed towards meeting the needs of rich winners in globalised markets. New models of innovative pro-poor products and services have emerged from deliberate and value-bound efforts of civil societies, firms, and political states to innovate in conditions of scarcity (Srinivas and Sutz 2008) and with contrary assumptions about systems and evolution (e.g. Arocena and Sutz 2003). Determinedly, these and other studies point toward many markets and complex regulatory choices and value-propositions for the state, the politics of technology transfer, and both structural as well as cognitive contexts for innovation. (Srinivas 2012). The state in developing countries is required to handle many markets (the “market menagerie”) with difficult political attendant questions of technological advance. Notably, scarcity-induced innovations and the typologies of innovation classes that follow are neither necessarily low-cost, nor rudimentary in scientific or engineering terms. Therefore, they push away also from traditional late industrial models and ‘catch-up’ frameworks which may be quite optimistic about the autonomy of the state (Ibid.). Similarly, the neo-Schumpeterian mechanisms of variation, inheritance and selection are often vague whilst firms and routines they describe rarely correspond to development realities (attention on ‘real firms’ that Penrose 1952 offers). Innovation problems may therefore need to be addressed with particular political and moral values in mind e.g. reduction of unjust poverty and inequality through innovation. This implies taking account of the complex system of social and political relations at macro-level. The latter

has been partly captured through the notion of innovation systems introduced by consistent neo-Schumpeterian thinkers such as Freeman and Soete (1997), Lundvall (1992) and Edquist (1997). These thinkers stressed that not only the market mechanism and firms (micro level) but also the state and politics (macro level) play key roles in innovation systems. As Freeman and Soete (1997: 14) put it:

The market mechanism can be useful technique for allocating resources in certain rather specific circumstances, but it has its limitations, so that the definition and implementation of social priorities for science and technology cannot be left simply to the free play of market forces ... The political system is inevitably involved...

One of the reasons that the challenge to liberalism and neo-liberalism is muted is arguably because the focus on institutional change that has swept economics and political economy (e.g. North 1989 and his later works) has alluded to value-propositions but has left these themes underdeveloped. This has meant that North's assertion that institutions are the 'rules of the game' has translated in many pieces of scholarship as relatively value-free structures and norms within which people economically participate. The push-back against policies propagating state minimalism and market-oriented solutions during the Washington consensus period for example, meant that 'neoliberalism' was clearly a dirty word. Yet institutional change by scholars such as North (1994) clearly acknowledge the complex relationship between institutional structures humans create and their 'mental models'.

The proposition that the cognitive and social modes of engagement with the world shape our responses to it is hardly a surprise. The explanations for why some frameworks are required and under what conditions is however worth exploring. For North (1994), the dominant explanation is how people react to the world in conditions of uncertainty. Uncertainty forces people to build frameworks and 'mental models' which shape the ideologies and institutions through which (in his other work) make the connection to specific institutions and growth

patterns. Seen in this way, institutional change's connection to economic growth in the neoclassical, transactions cost world, is quite closely in line with the world of uncertainty of the neo-Schumpeterians and the heterodoxy that pervades evolutionary economics at large. Uncertainty, in other words, provides the pivotal explanation in both approaches to situate for example, the innovator/entrepreneur's approach to specific economic or technological problems.

Yet, if uncertainty and the ways in which people respond (especially innovators) **are so important for innovators**, then uncertainty as a concept must do far more work than the selective attention to costs or to problem-choice. Srinivas and Sutz (2008), for example, provide a heuristic that attempts to situate innovators in developing country contexts as creatures who are both *cognitively located* in uncertainty having to establish mental models, and eventual routines as organizational creatures (similar to North's agent, and to the neo-Schumpeterian entrepreneur, or the Austrian homo-economicus) but they are also *structurally located*, as innovators within a world of knowledge and technological innovations that are politically and economically uneven, channeled by states, geopolitics, and the policy priorities of specific places and historical periods. Therefore, during the import substitution industrialization phase, this innovator would have likely faced little uncertainty about (high) import tariffs for needed equipment, but deep uncertainty on other fronts, from pricing to monopoly strategy (especially as a private firm in a world of nationalized firms).

What Srinivas and Sutz (ibid) remind us is that the cognitive dimension of innovation is fundamentally rooted in the socialization of problem-framing and -solving in what they term 'conditions of scarcity' (Ibid.) As such, no cognitive explanation of institutional change is

sufficient without a corresponding structural aspect of the problem. Simply put, developing countries are both developing in relative terms, but they are also developing within their own domestic context. Development is not a function only of relative catch-up but of deep domestic political change and social aspiration. While the two aspects of development are of course tied (import substitution industrialization is both a domestic political decision as well as an international trade and geopolitical position), juxtaposing industrialization as a relational process within which innovation emerges, creates the institutional explanation more robustly as a political economy question and moved further away from attention to the individual agent to the environment for action in which the state is the dominant organization and institution.

The work of these and other authors (e.g. Srinivas and Sutz 2008; Arocena and Sutz 2003; Lundvall XX; etc) is about the systemic aspects of the economy, of which the cognitive and structural features provide the essential scaffolding. In the examples on the health industry we find that the explanations can distinguish between a Cuban innovator and policy-maker jointly and successfully focusing in on Hib vaccine development versus the challenge of the ‘life-style’ medications from developing countries that have catered to export opportunities while detracting attention and policy focus from essential medicines. Seen separately either in cognitive or structural terms, we are unlikely to see the co-evolving mechanisms through which value priorities shape policies and incentives and/or lead individuals to certain problems. Recognizing the *systemic* relatedness of cognitive and structural institutions and organizations, then provides an *evolutionary* explanation for changes in agent action over time, but equally technological learning of firms or evolution of national capabilities over time.

3. Innovation as a Political Process: Responding to Uncertainty

While both neoclassical and neo-Schumpeterian frameworks hinge on uncertainty and wisely use it to frame economic change, it is the neo-Schumpeterians who wield the importance of uncertainty to its fullest extent, revealing its ties to dynamic economic growth. Uncertainty and the response of firms to uncertainty sets apart able from inept entrepreneurs, but equally situates the bounds of problem-framing and the development of active routines for learning. Uncertainty therefore provides the backdrop for learning through adaptation, and as such, creates the underlying basis for VSR i.e. variation, selection, retention.

What is clearly less developed however is who shapes the context for uncertainty and how innovators respond to it. In the first, are the usual attendant problems between ‘policy’ and ‘politics’ where policy is often well represented in neo-Schumpeterian analysis, and the latter less so. **EXPLAIN/CITE**. Second, ‘innovators’ are not a given class of society, neither well-defined by religion, race, or even easily self-identified. An innovator is not born, arguably he/she is made by his/her society in a given historical period and within certain types of moral and political values which institutional change. The utility of the cognitive and structural interplay is that why innovators act the way they do can be complemented by why some emerge as innovators, and then in turn why some problems are framed the way they are or accordingly solved. Least of all, as they argue, are innovators necessarily separate from ‘users’, nor should innovators be confused with R&D firms. These are not merely separate economic categorizations, they are social and political one because a low-income innovator devising an entirely new way to store solar power is fundamentally a different animal from the R&D team of a large multinational firm studying the same problem.

Similarly, in a large cohort of single national studies in Africa, and of comparative studies across other world regions with relevance for African pharmaceutical production, the context of inequality and values becomes routinely visible not only in the policy choices and occasional accountability frameworks for government, but also in the specific policy instrument design for production as well as access to medicine (Mackintosh et al. 2015). For instance, in the case of South African medicines, and Brazilian vaccines, **XXXXXXXXXX**.

It well could be argued that probing the neo-Schumpeterian context for values in the health industry is surely misleading because healthcare is so fraught with the human condition and the difficult ethical and moral dilemmas patients, providers, and companies must face. Indeed, Srinivas (2012) for example argues that it is precisely because of the character of the health industry and its complex institutional triad of production, consumption, and delivery, that we can more rigorously distinguish it from other industries such as garments or automotive where value choices may be less stark in policy-making (but do exist). The triad (2012, 8) reveals the systems and evolution in every dimension as well as their co-evolution. The health industry is not a simple equation of costs and benefits. What is technologically feasible is contingent on social choices, morality and politics; what is value-laden in turn is at least in part driven by the realm of what we perceive to be available or potentially so in terms of new technologies. Whether or not deaths or high morbidity due to malaria is morally and politically acceptable is driven by whether malaria vaccines are available, whether their solutions sit on shelves but have not been commercialized or otherwise deployed, whether bed nets or other preventative measures are available and affordable, or indeed whether malaria deaths are so routine and widespread that the issue remains invisible in plain sight exerting little political pressure for change. In fact, innovation as such raises new moral and political claims. For example the production of new anti-malarial vaccine or the development of an innovative drug for

childhood diseases immediately raises a new claim about their diffusion to global society and especially to those who need them most in developing countries. To put it another way, values and politics co-evolve with technical change and innovation (Papaioannou, 2011). In essence, this is co-evolution of normative and descriptive elements of the historical process of development of societies. Clear separation of these elements is impossible, given that one influences another.

With these observations in mind, we analyze two particular institutional, epistemological aspects of neo-Schumpeterian approaches to values. These are their emphasis on a) the systemic elements and b) the evolutionary features of the economy. Innovation is arguably more usefully seen as a predominantly political process that is both historical and contextual. The paper concludes with the implications for development politics of the relative absence of such political dimensions in innovation analysis. (742 words)

Both systemic and evolutionary features of the economy, if in fact intertwined, would require some attention to how and why policy and politics change, especially why technological advances seem to make life more not less, complicated for access to medicines issues. Shadlen (XXX) on Brazil, Srinivas (2012, 2015) on India, Mackintosh et al. (2016) on African countries, provide multiple case studies of the difficult political challenge for politicians and bureaucrats alike to face the ugly that sophistication in pharmaceuticals and biotechnologies necessarily means that redistributive priorities shape the delivery and consumption dimensions, a point that Srinivas (2012, 2015) emphasizes. If indeed, stores of well-supplied pharmacies and clinics are enjoined to deliver at affordable prices, than the global justice questions would not be quite so stark (see Papaioannou 2011).

The real challenge then is that it remains unclear in scholarship who exactly should be pushed to the wall to articulate the values by which the ordering of industrial priorities occur. In innovation scholarship, this tension is splitting communities of scholarship loosely joined as ‘neo-Schumpeterian’ into camps more or less markedly focused on developing economies and especially on politics. ‘Bottom of the Pyramid’ approaches for example, although clearly directed at an inclusive agenda (and as such as a value-driven one), does so primarily through traditional instruments of finance and economic policy, and with relatively low regard to political tensions of redistribution. It might in fact be said that if indeed a sustainable redistributive politics were possible, the ‘Bottom’ would have filtered upward to other areas and the ‘Pyramid’ would look less like one. It is true that where the Grameen Bank meets the BoP debate, the articulated values are to remove exploitation by middle men and to focus attention on design principles and credit terms amenable to affordable products, processes, and entrepreneurial ambitions.

Yet, the neo-Schumpeterian promise is the attention potentially directed to the business cycle which BoP despite being ‘inclusive’ and originating in business management literatures, is somewhat missing the business process and business cycle dynamics that Schumpeter himself stressed. The momentum required for public benefit to be articulated in a political system may rest with many different stakeholders. In most developing country democracies, the politicians and bureaucrats play critical roles. If their interests and value judgements, certainly their political rhetoric does not join ‘innovation’ with ‘inclusion’ in a simple way, they will articulate the goals without the means. For instance, several countries have spoken out for affordable medicines, but only some of them have taken this battle into and beyond the Doha Round and intellectual property statements (Papaioannou, 2016). These countries include Brazil and South Africa. The former introduced regulations for the grant of

compulsory licenses but was accused by the United States (US) and other developed nations for violation of TRIPS. The latter implemented TRIPS-compatible measures but these were challenged by multi-national companies (Correa and Matthews, 2011).

Similarly, few countries have successfully juggled production of medicines with the political momentum to keep their costs low and the consumption/delivery dimensions in check (e.g. Japan, see Srinivas 2012). Similarly, Cuba may have gone the farthest and longest in sustaining its institutional triad with clearly articulated values, but it has hardly done so by democratic means. India has perhaps gone the farthest in production measures as ‘Supplier to the World’ but hardly as a success story on its wider health redistributive agenda (Ibid.) and without what many see as cooption of the state by the private sector (e.g. Madhavi 2006).

In this respect, Brazil is surely an example to watch, swinging from political Right to Left, military rules to democracy, yet able to build out a solid social policy mandate which has trumped several other organizational and political priorities. Precisely because of the current corruption charges of the Rousseff government, an opportunity presents itself to understand what the new Left agenda can or should be for inclusive social policies. Because the corruption charges include deeply entrenched industrial stakeholders in the oil and gas sectors for example and industry and financial procedures (procurement, bidding, oversight, etc.), it would be impossible administratively and economically to separate the impact of reform on industry from potential redistributive ambitions-energy for the poor, utilities reform, and spatial distribution. Corruption, is after all, both politics and economy i.e. political economy of corruption. Seen in theoretical terms however, the neo-Schumpeterian state is not pushed to the wall, neither to defend legitimate, corrupt, or other political leaders, not to explain its

industrial investments (except by the traditional voting process we presume), not to suffer by retrenchment from one sector to another. Of course, political economists who were not Schumpeterian in their methods well recognized the challenge of value-driven processes, and these were bundled usually under ‘reform’. Grindle (2004, 2007) describes ‘good enough governance’ as a mechanism to elaborate on viable political reform and accountability measures, while Hirschman (1970) famously described the grey areas between exit, voice, and loyalty and the stickiness of public reform. Neither of course was concerned with technological innovation *per se*, but both recognize full well the political legitimacy challenge for state actors to renegotiate their existing relationships with citizens and businesses alike.

4. Redefining Innovation in Terms of History and Context: the Myth of Universality

Rather than treating existing and emerging patterns of technological innovation as socio-biological and value-neutral, we might re-define them as both historical and contextual patterns which embody moral and political values. This does not only reveal the political nature of innovation for development but also debunks the myth of universal values and institutions. As has been argued elsewhere (Srinivas, 2012: 1), development as such ‘...is a menagerie that houses many institutional varieties – especially of states and markets’. More specifically, markets take different forms in different historical and political contexts. In some countries markets are absent and in some others they are underdeveloped.

In any case, markets are not spontaneously created institutions which fail or succeed to deliver innovation-led growth and economic prosperity. Rather they are historically created through a complex process that involves social struggles, technological advance and the state. Indeed, as has been pointed out elsewhere (ibid: 2):

Even when dysfunctional or outright malevolent, and despite its limitations and contradictions, the state (and its governments) is inevitably the most important planning institution in these economies.

The same also holds true for developed capitalist countries. An increasing number of economists and political scientists (Perez, 2002; Block and Keller, 2011; Vallas, et al, 2011; Lundvall, 2013; Mazzucato, 2014) now agree that the political state has been the main driver of radical innovations with long-term effects for advanced economies and societies. Through the strategy of mission-oriented investments but also through the formalisation of normative directions for national, regional and sectoral innovation systems, the state has been actively promoting technological change. According to Mazzucato (2013: 196):

...the mission-oriented investments ... make up about 75 per cent of public sector investments in innovation in many advanced economies ... Such missions, from putting 'a man to the moon' to developing the Internet (which was done through DARA ...) are driven not by the dynamics of the private/social 'wedge' but by direct objectives of government in question. Indeed, almost all general purpose technologies were fundamentally state funded'.

Direct objectives of government are always justified in terms of normative, moral and political, values which provide the overarching framework for guiding political action and securing legitimacy. Value frameworks include liberalism, neo-liberalism, socialism and social democracy.

Clearly, since the 1980s, the moral and political justification of government objectives has been in terms of neo-liberal values of individual freedom and equality before the law, excluding egalitarian values of social justice. The neo-liberal normative framework is reflected in the introduction of a new IPRs regime that allowed new players such as publicly funded universities and research laboratories to patent products of their research and transfer their patents to private firms in the form of exclusive licenses (Corriat, 2015). The Bay-Dole Act of 1980 and the Orphan Drug Act of 1983 constitute major government interventions towards articulating values of neo-liberalism into a legal framework for science, technology and innovation. According to Corriat (ibid: 9):

The transformation introduced by the Bay-Dole Act was decisiveWith the introduction of the possibility of attributing the results of publically-funded research in the form of exclusive licenses to private firms the very foundations of the incentive to innovate through public grants lost both its meaning and its basis in the theory of well-being.

Yet, neo-liberal governments of the 1980s, including the Reagan administrations, also seem to drive radical innovations which could not be possibly driven by neo-liberal markets due to their

risky nature. The normative justification for this was often security of the neo-liberal state and its values of individual freedom and equality before the law (Block, 2011).

Certainly, the extension of neo-liberal objectives to developing countries through the so called ‘Washington Consensus’ and ‘Structural Adjustment Programmes’ has failed to deliver across a range of regions, including Latin America, Sub-Saharan Africa and Eastern Europe (Papaioannou, 2014). The neo-liberal doctrine behind the state of innovation in the last quarter of the 20th century has instead led to phenomenal inequality that now poses a fundamental challenge to sustainable prosperity in the 21st century (Ince, 2014; Pikety, 2013). This top-down science and technology (S&T) based innovation has claimed to be value-neutral but in practice has been a neo-liberal value-bound and a major contributing factor to the growing divide between rich and poor (Krugman, 2002; Chataway et al, 2014). Evidence suggests that how S&T based innovation is framed is a serious barrier to its usefulness in resolving major problems of social justice (Papaioannou, 2013). Top-down innovation has been hierarchical and largely conducted separately from other non-government efforts to tackling major global challenges, notably in health, agriculture and energy. Therefore, it has excluded important segments of the population, failing to address inequality and the potential for long-term socio-economic prosperity.

In response to value-neutral, hierarchical and exclusive innovation that has been directed towards meeting the needs of rich winners in globalised markets, new models of innovative pro-poor products and services have emerged. These more inclusive models of innovation have not been spontaneous by-products of globalised markets but deliberate and value-bound efforts

of civil societies and political states to innovate in conditions of scarcity. According to Srinivas and Sutz (2008: 132-133):

...scarcity-induced innovations (SII) [are] emerging from at least four important characteristics.

Cognitive: a) the canonical set of solutions can be relatively obscure and even absent from the mental landscape of the innovator, b) the innovator, even being aware of such set, is unable to use it and faces the need to address the problem differently.

Institutional or physical: lack of supporting organisations, laws, and technical instruments.

Socio-economic: a) when problems affecting developing societies have not been tackled at all b) existence of policy biases or c) solutions available are unaffordable, and new searching avenues need to be pursued ...

SII do not “scale up”. Individual capabilities do not translate into appreciable transmissible means of knowledge. SII are, more often than not “encapsulated” innovations. They can be “locally strong” yet remain isolated.

These four characteristics of SII cannot be easily understood by those neo-Schumpeterian thinkers who conceive innovation in socio-biological and value-neutral terms. As has been already implied, in developmental contexts, mechanisms of variation, inheritance and selection are vague whilst firms and routines barely exist in the way that such thinkers assume. Instead, there are pressing innovation problems which need to be addressed with particular political and moral values in mind e.g. reduction of unjust poverty and inequality through innovation.

5. Conclusion

Neo-Schumpeterian thinkers are far from constituting a unified school of thought in innovation. This paper has shown that some of them tend to adopt value-neutral approaches and in this sense they are inconsistent with Schumpeter's theory of economic development. Most of these thinkers work within socio-biological frameworks of technological change and evolution, and tend to abstract from historical processes of value formation that influences the normative direction of innovation systems in developed and developing contexts. By contrast, some other thinkers appear to be more consistent neo-Schumpeterians, taking history and values seriously in their analysis of technological innovation. In doing so they understand politics and the state to be factors of generation of novel products and processes. For consistent neo-Schumpeterian thinkers the direction of innovation systems is predominantly normative and political. By contrast, socio-biologists are non-directional since for them the evolution of new technologies is a blind and non-teleological process of development. In conclusion, it might be said that independently of approach, neo-Schumpeterians need to explain better new emerging models of innovation. These models go beyond the classical notion of innovation as an evolutionary process based on individual entrepreneurship.

Certainly, it would be very difficult, almost impossible, to separate clearly normative and descriptive elements of innovation. This is because both such elements are embedded in the historical process of evolution of human societies. What is clear is that technical solutions to innovation problems are morally and politically bound and not value-neutral. Also, it would be

too quick to write off neo-Schumpeterian analysis as a large umbrella under which value-focused economics analysis is possible. Neo-Schumpeterians offer a critical counter to an even worse value-free proposition by mainstream economics. The reason for its contributions is it recognizes the dynamism of the economy, and the importance ironically, for values and politics in the contexts of uncertainty and open-ended economic outcomes. The normative agenda for orthodox economics and its positivist ambitions in policy-design often argued for an implicit value offered by industry or innovation or of pro-market principles. This is a wide, long-standing debate not least of which for developing countries has included a charged political agenda on public sector dismantling from the Washington Consensus days. The assumed, narrow, behavioural standing of homo economicus in neoclassical economics leaves heterodox economics approaches to values somewhat implicit and subdued, but nevertheless perhaps an improvement. In part the advantage of the emphasis on uncertainty and open-endedness forces the marriage of political economy of late industrial development with evolutionary perspectives (Srinivas 2012). Furthermore, the sector-specific insistence from the neo-Schumpeterians that industry dynamics matter means that from health to gender, from ethics to markets, the clarifications of economic theory and policy become more visible (see also Culyer 1989; Hodgson 2000; Nelson 1999; Keita 1997).

Ironically, the agent-based modelling which offer the least articulation of values, perhaps offer the greatest insights of the open-ended, systemic, and evolving economy. The stripped-down models which build to greater complexity allow us some vantage points about whether we are essentially different as societies from those of wasps or bonobos, and whether we really wish to be or not.

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